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Occupational Employment and Wages For Selected Engineering Occupations in Michigan's Metropolitan Areas — May 2016

Among the 15 metropolitan areas located entirely or partially in Michigan, 11 areas had annual mean wages that were significantly below the national average for electrical engineers, the U.S. Bureau of Labor Statistics reported today. Nine areas had below-average wages for civil engineers and mechanical engineers. Industrial engineers in seven areas had wages that were significantly below the national average. Assistant Commissioner for Regional Operations Charlene Peiffer noted that two metropolitan areas, Detroit-Warren-Dearborn and Midland, had annual wages that were significantly higher than the national average for industrial engineers. Nationwide, the average (mean) wage for mechanical engineers was $89,800; for industrial engineers, $88,530; for electrical engineers, $98,620; and for civil engineers, $89,730. (See table A. For comprehensive definitions of metropolitan areas in Michigan, please see the Technical Note.)

Table A. Average (mean) annual wages for selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2016

Area	Mechanical Engineers	Industrial Engineers	Electrical Engineers	Civil Engineers
United States	$89,800	$88,530	$98,620	$89,730
Michigan	88,700	86,990	87,610*	76,560*
Ann Arbor	84,130*	87,670	89,740*	93,690
Battle Creek	99,320	84,190	68,490*	(1)
Bay City	86,460	89,180	(1)	(1)
Detroit-Warren-Dearborn	91,810	91,710*	90,510*	77,910*
Detroit-Dearborn-Livonia	91,470	89,930	94,240*	83,980*
Warren-Troy-Farmington Hills	92,000	92,560*	88,480*	75,860*
Flint	76,500*	(1)	(1)	68,300*
Grand Rapids-Wyoming	71,550*	77,930*	74,260*	72,660*
Jackson	90,500	77,440*	99,560	86,120
Kalamazoo-Portage	77,940*	76,430*	90,350*	70,920*
Lansing-East Lansing	69,870*	81,080*	79,550*	74,570*
Midland	58,770*	100,210*	89,490*	(1)
Monroe	78,550*	74,100*	72,290*	60,260*
Muskegon	76,910*	73,550*	75,220*	71,960*
Niles-Benton Harbor	95,830	86,670	93,850	(1)
Saginaw	71,880*	71,560*	75,760*	66,890*
South Bend-Mishawaka	89,900	90,780	71,510*	68,740*

Footnotes:
(1) Data not available.
Note: An asterisk indicates that the mean annual wage for this area is significantly different from the national average of all areas at the 90-percent confidence level.

Total employment for the four selected engineering occupations in Michigan was 86,110. Sixty-nine percent (59,370) of the combined state employment was located in the Detroit-Warren-Dearborn metropolitan area (the Detroit MSA). The Grand Rapids-Wyoming area had a combined employment of 7,580 for the four engineering occupations. In each of the remaining areas for which data were available for the four occupations, total employment was less than 2,000. (See table B.)

Table B. Employment of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2016

Area	Mechanical Engineers	Industrial Engineers	Electrical Engineers	Civil Engineers
United States	285,790	256,550	183,770	287,800
Michigan	42,080	26,660	9,780	7,590
Ann Arbor	930	(1)	220	130
Battle Creek	330	240	110	(1)
Bay City	60	70	(1)	(1)
Detroit-Warren-Dearborn	31,550	16,030	6,950	4,840
Detroit-Dearborn-Livonia	11,270	5,180	2,450	1,230
Warren-Troy-Farmington Hills	20,280	10,850	4,500	(1)
Flint	250	290	(1)	60
Grand Rapids-Wyoming	2,820	3,230	840	690
Jackson	980	360	380	120
Kalamazoo-Portage	750	320	80	150
Lansing-East Lansing	590	400	160	730
Midland	(1)	(1)	40	(1)
Monroe	230	110	130	(1)
Muskegon	280	450	50	60
Niles-Benton Harbor	940	270	210	(1)
Saginaw	410	230	(1)	130
South Bend-Mishawaka	220	340	70	170

Footnotes:
(1) Data not available.

Location quotients (LQs) allow us to explore the occupational make-up of a metropolitan area by comparing the composition of jobs in an area relative to the national average. For example, a location quotient of 2.0 indicates that an occupation accounts for twice the share of employment in the area than it does nationally.

Several of Michigan's areas had high LQs for mechanical engineers and industrial engineers. For mechanical engineers, the Jackson area and the Detroit MSA each had a location quotient of 8.1, meaning mechanical engineers were employed in these areas at 8.1 times the national rate. Niles-Benton Harbor (7.6) and Battle Creek (3.0) also had high LQs for mechanical engineers. Areas with high LQs for industrial engineers included the Detroit MSA (4.6) and Muskegon (4.0). (See table C.)

Table C. Location quotients of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2016

Area	Mechanical Engineers	Industrial Engineers	Electrical Engineers	Civil Engineers
United States	1.0	1.0	1.0	1.0
Michigan	4.9	3.5	1.8	0.9
Ann Arbor	2.2	(1)	0.8	0.3
Battle Creek	3.0	2.4	1.5	(1)
Bay City	0.8	1.2	(1)	(1)
Detroit-Warren-Dearborn	8.1	4.6	2.8	1.2
Detroit-Dearborn-Livonia	7.7	4.0	2.6	0.8
Warren-Troy-Farmington Hills	8.3	4.9	2.9	(1)
Flint	0.9	1.2	(1)	0.2

Note: See footnotes at end of table.

Table C. Location quotients of selected engineering occupations in the United States, Michigan, and metropolitan areas in Michigan, May 2016 - Continued

Area	Mechanical Engineers	Industrial Engineers	Electrical Engineers	Civil Engineers
Grand Rapids-Wyoming	2.5	3.2	1.2	0.6
Jackson	8.1	3.3	4.9	1.0
Kalamazoo-Portage	2.7	1.3	0.4	0.5
Lansing-East Lansing	1.4	1.1	0.6	1.7
Midland	(1)	(1)	0.8	(1)
Monroe	2.8	1.5	2.5	(1)
Muskegon	2.2	4.0	0.6	0.5
Niles-Benton Harbor	7.6	2.4	2.7	(1)
Saginaw	2.4	1.5	(1)	0.7
South Bend-Mishawaka	0.8	1.4	0.4	0.6

Footnotes:
(1) Data not available.

Wages for electrical engineers in Michigan's metropolitan areas

Electrical engineers in 11 metropolitan areas for which data were available had annual wages that were significantly below the national average of $98,620. Wages in these metropolitan statistical areas ranged from $90,510 in the Detroit MSA to $68,490 in Battle Creek. Electrical engineers in the Jackson and Niles-Benton Harbor areas earned wages that were not measurably different from the national average for this occupation.

Wages for civil engineers in Michigan's metropolitan areas

Civil engineers in nine metropolitan areas for which data were available had annual wages that were significantly lower than the U.S. average of $89,730. Wages in these nine areas ranged from $77,910 in the Detroit MSA to $60,260 in Monroe. Wages were not measurably different from the national average in Ann Arbor and Jackson.

Wages for mechanical engineers in Michigan's metropolitan areas

In nine metropolitan areas, mechanical engineers had annual wages that were significantly lower than the U.S. average of $89,800, ranging from $84,130 in Ann Arbor to $58,770 in Midland. Mechanical engineers in the remaining six areas earned wages that were not measurably different from the national average for this occupation.

Wages for industrial engineers in Michigan's metropolitan areas

Industrial engineers in Midland and in the Detroit MSA earned an average wage of $100,210 and $91,710, respectively. These were the only areas in the state with wages that were significantly above the U.S. average of $88,530 for industrial engineers. Seven metropolitan areas had wages that were measurably lower than the national average, ranging from $81,080 in the Lansing-East Lansing area to $71,560 in Saginaw. Industrial engineers in the remaining five areas for which data were available earned wages that were not significantly different from the national average.

These statistics are from the Occupational Employment Statistics (OES) survey, a federal-state cooperative program between BLS and State Workforce Agencies, in this case, the Michigan Department of Technology, Management and Budget, and the Indiana Department of Workforce Development.

Note

A value that is statistically different from another does not necessarily mean that the difference has economic or practical significance. Statistical significance is concerned with the ability to make confident statements about a universe based on a sample. It is entirely possible that a large difference between two values is not significantly different statistically, while a small difference is, since both the size and heterogeneity of the sample affect the relative error of the data being tested.

Technical Note

The Occupational Employment Statistics (OES) survey is a semiannual mail survey measuring occupational employment and wage rates for wage and salary workers in nonfarm establishments in the United States. The OES data available from BLS include cross-industry occupational employment and wage estimates for the nation; over 650 areas, including states and the District of Columbia, metropolitan statistical areas (MSAs), metropolitan divisions, nonmetropolitan areas, and territories; national industry-specific estimates at the NAICS sector, 3-, 4-, and selected 5- and 6-digit industry levels, and national estimates by ownership across all industries and for schools and hospitals. OES data are available at www.bls.gov/oes/tables.htm.

OES estimates are constructed from a sample of about 1.2 million establishments. Each year, two semiannual panels of approximately 200,000 sampled establishments are contacted, one panel in May and the other in November. Responses are obtained by mail, Internet or other electronic means, email, telephone, or personal visit. The May 2016 estimates are based on responses from six semiannual panels collected over a 3-year period: May 2016, November 2015, May 2015, November 2014, May 2014, and November 2013. The overall national response rate for the six panels, based on the 50 states and the District of Columbia, is 73 percent based on establishments and 69 percent based on weighted sampled employment. The unweighted employment of sampled establishments across all six semiannual panels represents approximately 58 percent of total national employment. For more information about OES concepts and methodology, go to www.bls.gov/news.release/ocwage.tn.htm.

The May 2016 OES estimates are based on the 2010 Standard Occupational Classification (SOC) system and the 2012 North American Industry Classification System (NAICS). Information about the 2010 SOC is available on the BLS website at www.bls.gov/soc and information about the 2012 NAICS is available at www.bls.gov/bls/naics.htm.

Metropolitan area definitions

The substate area data published in this release reflect the standards and definitions established by the U.S. Office of Management and Budget.

- **Ann Arbor, Mich. Metropolitan Statistical Area (MSA)** includes Washtenaw County in Michigan.
- **Battle Creek, Mich. MSA** includes Calhoun County in Michigan.
- **Bay City, Mich. MSA** includes Bay County in Michigan.
- **Detroit-Warren-Dearborn, Mich. MSA** includes the following:
    - **Detroit-Dearborn-Livonia, Mich. Metropolitan Division (MD)** includes Wayne County in Michigan.
    - **Warren-Troy-Farmington Hills, Mich. MD** includes Lapeer, Livingston, Macomb, Oakland and St. Clair Counties in Michigan.

- **Flint, Mich. MSA** includes Genesee County in Michigan.
- **Grand Rapids-Wyoming, Mich. MSA** includes Barry, Kent, Montcalm, and Ottawa Counties in Michigan.
- **Jackson, Mich. MSA** includes Jackson County in Michigan.
- **Kalamazoo-Portage, Mich. MSA** includes Kalamazoo and Van Buren Counties in Michigan.
- **Lansing-East Lansing, Mich. MSA** includes Clinton, Eaton, and Ingham Counties in Michigan.
- **Midland, Mich. MSA** includes Midland County in Michigan.
- **Monroe, Mich. MSA** includes Monroe County in Michigan.
- **Muskegon, Mich. MSA** includes Muskegon County in Michigan.
- **Niles-Benton Harbor, Mich. MSA** includes Berrien County in Michigan.
- **Saginaw, Mich. MSA** includes Saginaw County in Michigan.
- **South Bend-Mishawaka, Ind.-Mich. MSA** includes Cass County in Michigan and St. Joseph County in Indiana.

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